MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2018 / 2019

TIS 3151 –SOFTWARE RELIABILITY AND QUALITY ASSURANCE

(All sections / Groups)

6 MARCH 2019
2:30 P.M. – 4:30 P.M.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages (including cover page) with 5 Questions only.

2. Attempt **ANY FOUR** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please print all your answers in the Answer Booklet provided.

Question 1 (15 marks)

a) According to the IEEE definition of SQA, quality control (QC) is not equated with quality assurance (QA). In what respects does QC vary from QA?

[2 Marks]

b) MyHouse Bhd is a manufacturer of washing machines and dishwashers. The requirements document for the new control unit included the following specifications:

a. The firmware should be suitable for all six variations of model 2002 washing machines.

b. The water level control module of the washing machine should be suitable for use as a water level control module in the new model 2002 dishwasher.

i. To which of the quality factors do the above requirements belong?

ii. Explain your answer.

[4 Marks]

c) Describe the process of defining a new software quality metric.

[3 marks]

d) Describe any **THREE** software quality assurance activities. For each activity, explain how the activity can lead to quality in the software product.

[6 Marks]

Continued...

Question 2 (15 marks)

a) Multimedia Business Bhd is a company that has grown throughout the years. In the beginning, they only used a computerized Financial System in their Accounts Department. As their business grow, other departments such as Human Resources, Sales & Marketing and Purchasing Departments are to be computerized and the top management of the company decided to invite vendors to propose their systems to the company. You are assigned to prepare the request for proposal for the Human Resources System.

i. Explain the importance of software reliability for this system.

[3 marks]

ii. Illustrate how you specify the software reliability in this system with the following types of reliability metrics:

- Probability of failure on demand (POFOD)
- Rate of fault occurrence (ROCOF)

[4 marks]

b) Explain the difference between fault avoidance, fault detection, and fault tolerance.

[3 marks]

c) Describe the concept of N-version programming in ensuring software reliability. Illustrate with a diagram.

[5 marks]

Continued...

Question 3 (15 marks)

a) Briefly describe the ISO 90003 standards and its relevance to software quality assurance.

[2 marks]

b) Draw a diagram to illustrate the process-based Quality Management System prescribed by ISO 9000 standards.

[7 marks]

c) Explain how the ISO 9001:2015 applies the Plan-Do-Check-Act methodology in its requirements.

[4 marks]

d) Give any **TWO** advantages and any **TWO** disadvantages for an organization to be certified to ISO 9000 standards.

[2 marks]

Question 4 (15 marks)

a) Describe the **FOUR** categories that groups the process areas in Capability Maturity Model Integration (CMMI).

[8 marks]

b) MyIT Solutions Sdn Bhd is a software development company with CMMI Level 3 certification.

i. List any **SIX** process areas that MyIT have in place to conform to this certification.

[3 marks]

ii. Describe what the company should do to achieve CMMI Level 4 certification.

[2 marks]

c) Briefly explain what is SCAMPI in relation to CMMI.

[2 marks]

Continued...

Question 5 (15 marks)

ProblemSolvers Sdn Bhd is a software solutions company that provides solutions to many customers in the construction industry. After a few years of successfully building the business, the top management of the company has decided to incorporate Total Quality Management (TQM) in the company activities.

a) Give **THREE** benefits that the company would obtain if it is successful in implementing TQM.

[3 marks]

b) With reference to the TQM wheel, discuss the main activities for the company to achieve TQM.

[5 marks]

ProblemSolvers recently obtained a new project from a large construction company that has many offices throughout Malaysia. The customer requires a new software product to be developed that includes the use of the World Wide Web to capture transactions and provide up-to-date information for online queries.

c) Describe **TWO** possible technical risks for this new project.

[4 marks]

d) Discuss how the impact of these risks can be minimized in the project.

[3 marks]

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